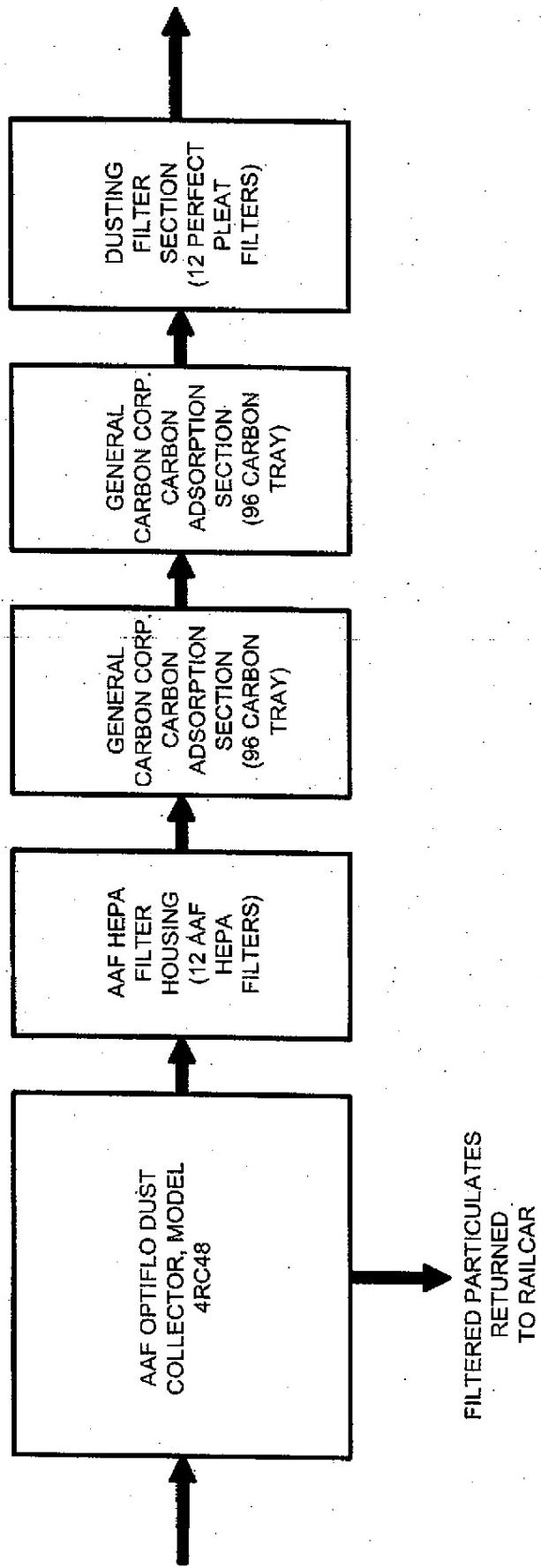


## **FIGURES**



NOTE:  
FLOW CYCLE DIAGRAM PROVIDED BY  
RICHMOND TECH AIR.



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MHF LOGISTICAL SOLUTIONS

5800 WESTSIDE AVE - SOIL TRANSLOAD FACILITY

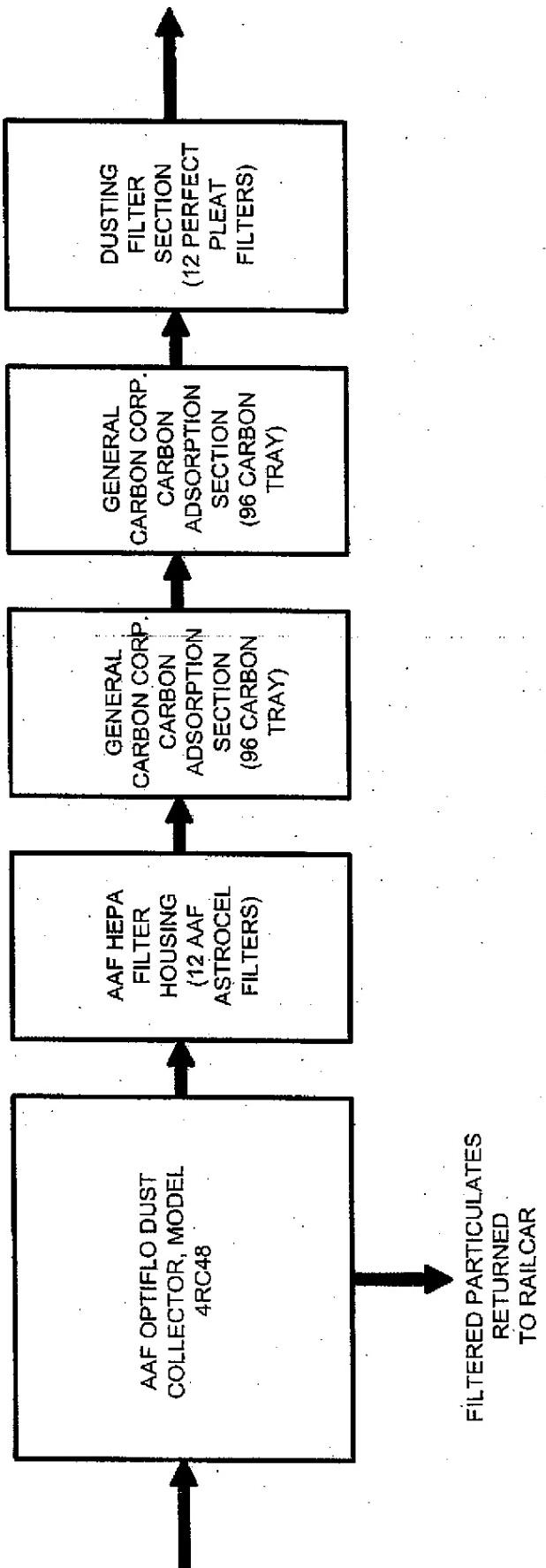
FLOW CYCLE DIAGRAM

CONTAMINATED SOIL APPLICATION

FIGURE NO.

1

PROJECT NO.  
070159



NOTE:  
FLOW CYCLE DIAGRAM PROVIDED BY  
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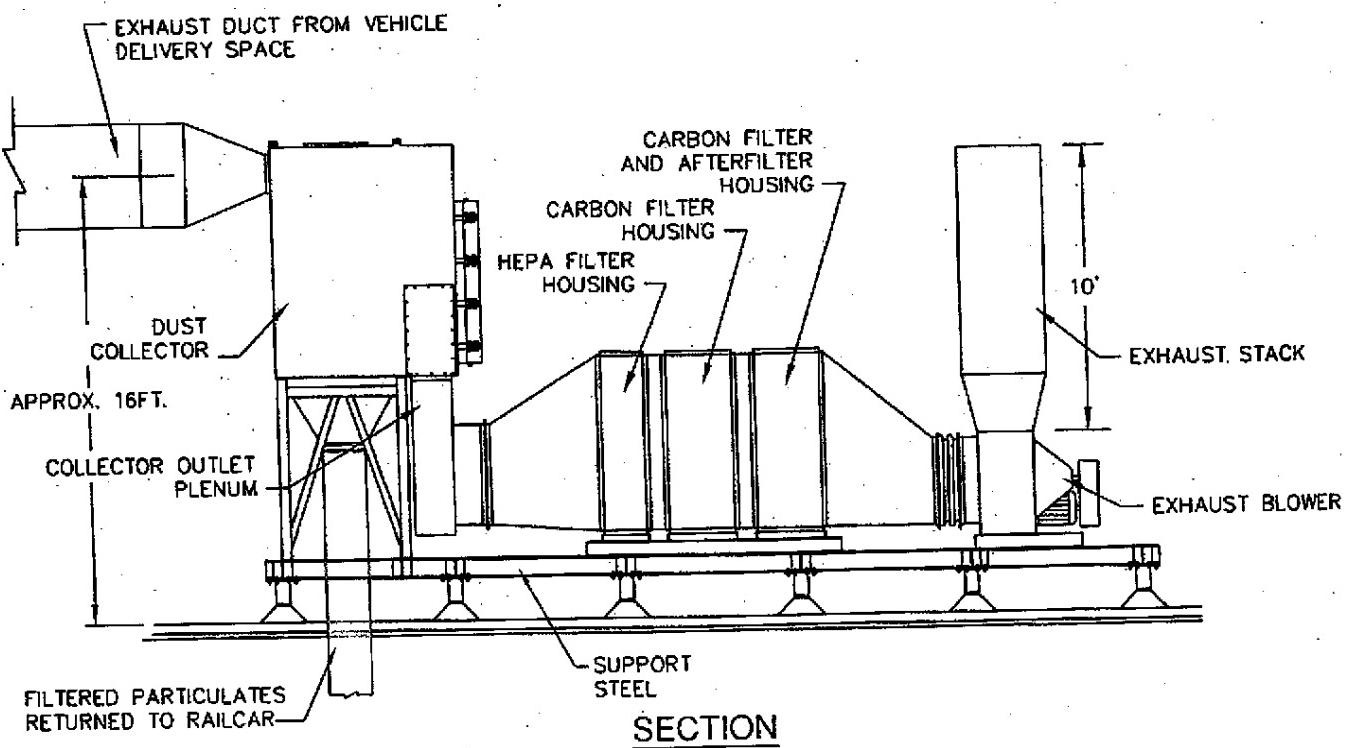
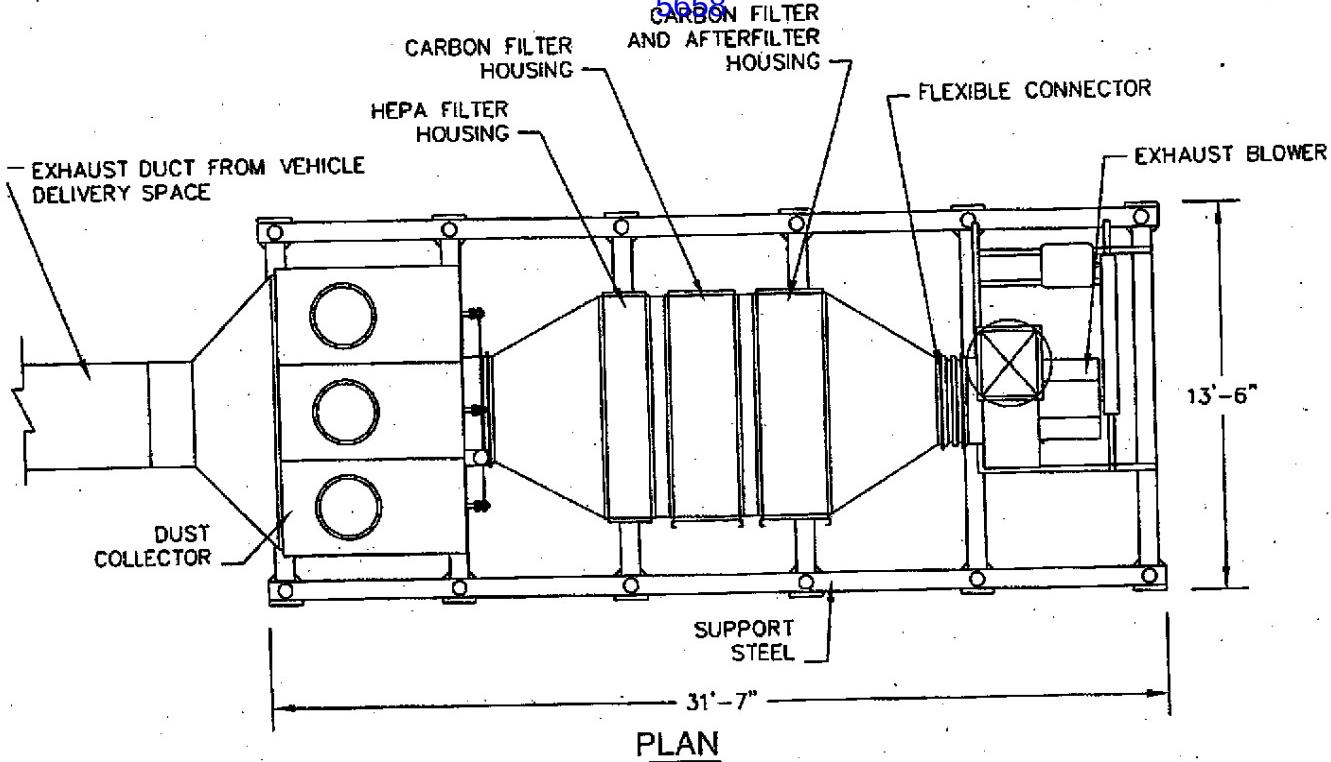


MF LOGISTICAL SOLUTIONS  
5800 WESTSIDE AVE - SOIL TRANLOAD FACILITY  
FLOW CYCLE DIAGRAM  
LOW LEVEL RADIOACTIVE  
CONTAMINATED SOIL APPLICATION

FIGURE NO.  
**2**  
PROJECT NO.  
070159

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5658

NOTE:

DUST COLLECTION DRAWING SHOWN WAS PROVIDED BY RICHMOND  
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MHF LOGISTICAL SOLUTIONS  
5800 WESTSIDE AVENUE - SOIL TRANSLOAD FACILITY

**DUST COLLECTION SYSTEM**

FIGURE NO.

**3**

PROJECT NO.  
070159

**CAPTURE SYSTEM**

Fugitive Dust & Odor Capture System  
MHF Logistical Solutions, Inc.  
5800 West Side Avenue Soil Transload Facility  
North Bergen, New Jersey

MHF Logistical Solutions, Inc., (MHF) transloads soil from truck to rail at the 5800 West Side Avenue soil transload facility. The soil is brought to the facility by truck and is then end dumped into rail cars. Trucks containing soil enter the facility and report to trained facility representatives. After determination of the contents of the material, appropriate measures are implemented to protect facility personnel and the environment on a shipment-by-shipment basis. In general, the truck backs up the facility ramp under the guidance of facility personnel, the driver exits the vehicle to a safe, external area, and a high speed door closes the truck inside the contained facility. The soil in the truck is then transferred through a contained chute mechanism into a waiting railcar. During the soil transload, fugitive dust and odor may enter the building's internal, contained airspace. In order to collect and fully control the fugitive dust and odor in the building airspace, a permanent total enclosure is created through the use of engineering controls that include filtered ventilation and other advanced control devices noted on the attached plans. The advanced filtration and ventilation system enables capture and collection of fugitive dust and odor during transloading operations.

The proposed facility consists of a T-shaped building 170' long x 30' wide x 27' high. The T-shape is formed with an extension building 60' long x 30' wide by 30' high. The building arrangement drawings are attached. Two doors (12' wide x 16' high and 14' wide by 16' high) are located at opposite ends of the building for railcar access. One 12' wide by 17' high door is provided for truck access and one 20' wide by 14' high door is provided for backhoe access. Both of these latter two doors will be closed during transloading operations and therefore serve to contain the facility's internal airspace and to enhance filtration and capture of facility air flow.

NJDEP requires this facility to filter an amount of air equal to the building volume at a rate of six times per hour, or six full building air changes per hour. Therefore, the exhaust air rate is designed to operate at 20,890 cfm.

In order to effectively capture and fully control the trace fugitive dust emissions that may develop at this facility, the building is designed as a Permanent Total Enclosure (PTE) to meet EPA guidelines for fugitive dust capture efficiency. The criteria for PTE are outlined in the attached EPA document Guidelines for Determining Capture Efficiency, Method 204.

Using these guidelines we have designed the ventilation for this facility as follows:

1. The exhaust air volume from the facility will be 24,000 cfm and this exhaust air volume will be directed to an AAF Cartridge Dust Collector with a dust collection efficiency of 99%.

2. During material transload from the trucks to the railcars, the truck and backhoe doors will be closed and the railcar doors will be partially blocked by the railcar. Therefore the velocity of the air entering the facility will be 200 feet per minute (200 fpm).
3. Calculations for door openings are as follows:
  - a. Railcar openings: 2 required (assume 75% of the door area is blocked by railcar and plastic strip curtains)

Exhaust air volume through railcar openings  
 $((12' \times 16') + (14' \times 16')) \times 0.25 \times 200 = 20,800 \text{ cfm.}$
  - b. Truck traffic opening: 1 required (normally closed – opened only to allow truck entry and exit)
  - c. Backhoe door: 1 required (normally closed)
4. When the design of the building enclosure meets the EPA criteria, indicating that its efficiency is 100 percent, then no testing for capture efficiency is necessary.

**METHOD 204--CRITERIA FOR AND VERIFICATION OF A PERMANENT OR TEMPORARY TOTAL ENCLOSURE**

**1. SCOPE AND APPLICATION**

This procedure is used to determine whether a permanent or temporary enclosure meets the criteria for a total enclosure. An existing building may be used as a temporary or permanent enclosure as long as it meets the appropriate criteria described in this method.

**2. SUMMARY OF METHOD**

An enclosure is evaluated against a set of criteria. If the criteria are met and if all the exhaust gases from the enclosure are ducted to a control device, then the volatile organic compounds (VOC) capture efficiency (CE) is assumed to be 100 percent, and CE need not be measured. However, if part of the exhaust gas stream is not ducted to a control device, CE must be determined.

**3. DEFINITIONS**

**3.1 Natural Draft Opening (NDO).** Any permanent opening in the enclosure that remains open during operation of the facility and is not connected to a duct in which a fan is installed.

**3.2 Permanent Total Enclosure (PE).** A permanently installed enclosure that completely surrounds a source of emissions such that all VOC emissions are captured and contained for discharge to a control device.

**3.3 Temporary Total Enclosure (TTE).** A temporarily installed enclosure that completely surrounds a source of

emissions such that all VOC emissions that are not directed through the control device (i.e. uncaptured) are captured by the enclosure and contained for discharge through ducts that allow for the accurate measurement of the uncaptured VOC emissions.

**3.4 Building Enclosure (BE).** An existing building that is used as a TTE.

#### **4. SAFETY**

An evaluation of the proposed building materials and the design for the enclosure is recommended to minimize any potential hazards.

### **5. CRITERIA FOR TEMPORARY TOTAL ENCLOSURE**

**5.1** Any NDO shall be at least four equivalent opening diameters from each VOC emitting point unless otherwise specified by the Administrator.

**5.2** Any exhaust point from the enclosure shall be at least four equivalent duct or hood diameters from each NDO.

**5.3** The total area of all NDO's shall not exceed 5 percent of the surface area of the enclosure's four walls, floor, and ceiling.

**5.4** The average facial velocity (FV) of air through all NDO's shall be at least 3,600 m/hr (200 fpm). The direction of air flow through all NDO's shall be into the enclosure.

**5.5** All access doors and windows whose areas are not included in section 5.3 and are not included in the calculation in section 5.4 shall be closed during routine operation of the

process.

## 6 CRITERIA FOR A PERMANENT TOTAL ENCLOSURE

6.1 Same as sections 5.1 and 5.3 through 5.5.

6.2 All VOC emissions must be captured and contained for discharge through a control device.

## 7. QUALITY CONTROL

7.1 The success of this method lies in designing the TTE to simulate the conditions that exist without the TTE (i.e., the effect of the TTE on the normal flow patterns around the affected facility or the amount of uncaptured VOC emissions should be minimal). The TTE must enclose the application stations, coating reservoirs, and all areas from the application station to the oven. The oven does not have to be enclosed if it is under negative pressure. The NDO's of the temporary enclosure and an exhaust fan must be properly sized and placed.

7.2 Estimate the ventilation rate of the TTE that best simulates the conditions that exist without the TTE (i.e., the effect of the TTE on the normal flow patterns around the affected facility or the amount of uncaptured VOC emissions should be minimal). Figure 204-1 or the following equation may be used as an aid.

$$CE = \frac{Q_G C_G}{Q_G C_G + Q_F C_F}$$

Eq. 204-1

Measure the concentration ( $C_6$ ) and flow rate ( $Q_6$ ) of the captured gas stream, specify a safe concentration ( $C_F$ ) for the uncaptured gas stream, estimate the CE, and then use the plot in Figure 204-1 or Equation 204-1 to determine the volumetric flow rate of the uncaptured gas stream ( $Q_F$ ). An exhaust fan that has a variable flow control is desirable.

7.3 Monitor the VOC concentration of the captured gas steam in the duct before the capture device without the TTE. To minimize the effect of temporal variation on the captured emissions, the baseline measurement should be made over as long a time period as practical. However, the process conditions must be the same for the measurement in section 7.5 as they are for this baseline measurement. This may require short measuring times for this quality control check before and after the construction of the TTE.

7.4 After the TTE is constructed, monitor the VOC concentration inside the TTE. This concentration should not continue to increase, and must not exceed the safe level according to Occupational Safety and Health Administration requirements for permissible exposure limits. An increase in VOC concentration indicates poor TTE design.

7.5 Monitor the VOC concentration of the captured gas stream in the duct before the capture device with the TTE. To limit the effect of the TTE on the process, the VOC concentration with and without the TTE must be within 10 percent. If the

measurements do not agree, adjust the ventilation rate from the TTE until they agree within 10 percent.

**8. PROCEDURE**

8.1 Determine the equivalent diameters of the NDO's and determine the distances from each VOC emitting point to all NDO's. Determine the equivalent diameter of each exhaust duct or hood and its distance to all NDO's. Calculate the distances in terms of equivalent diameters. The number of equivalent diameters shall be at least four.

8.2 Measure the total surface area ( $A_T$ ) of the enclosure and the total area ( $A_N$ ) of all NDO's in the enclosure. Calculate the NDO to enclosure area ratio (NEAR) as follows:

$$NEAR = \frac{A_N}{A_T} \quad \text{Eq. 204-2}$$

The NEAR must be  $\leq 0.05$ .

8.3 Measure the volumetric flow rate, corrected to standard conditions, of each gas stream exiting the enclosure through an exhaust duct or hood using EPA Method 2. In some cases (e.g., when the building is the enclosure), it may be necessary to measure the volumetric flow rate, corrected to standard conditions, of each gas stream entering the enclosure through a forced makeup air duct using Method 2. Calculate FV using the following equation:

$$FV = \frac{Q_o - Q_i}{A_N} \quad \text{Eq. 204-3}$$

where:

$Q_o$  = the sum of the volumetric flow from all gas streams exiting the enclosure through an exhaust duct or hood.

$Q_i$  = the sum of the volumetric flow from all gas streams into the enclosure through a forced makeup air duct; zero, if there is no forced makeup air into the enclosure.

$A_N$  = total area of all NDO's in enclosure.

The FV shall be at least 3,600 m/hr (200 fpm).

Alternatively, measure the pressure differential across the enclosure. A pressure drop of 0.013 mm Hg (0.007 in.  $H_2O$ ) corresponds to an FV of 3,600 m/hr (200 fpm).

8.4 Verify that the direction of air flow through all NDO's is inward. If FV is less than 9,000 m/hr (500 fpm), the continuous inward flow of air shall be verified using streamers, smoke tubes, or tracer gases. Monitor the direction of air flow for at least 1 hour, with checks made no more than 10 minutes apart. If FV is greater than 9,000 m hr (500 fpm), the direction of air flow through the NDOs shall be presumed to be inward at all times without verification.

#### **9. DIAGRAMS**

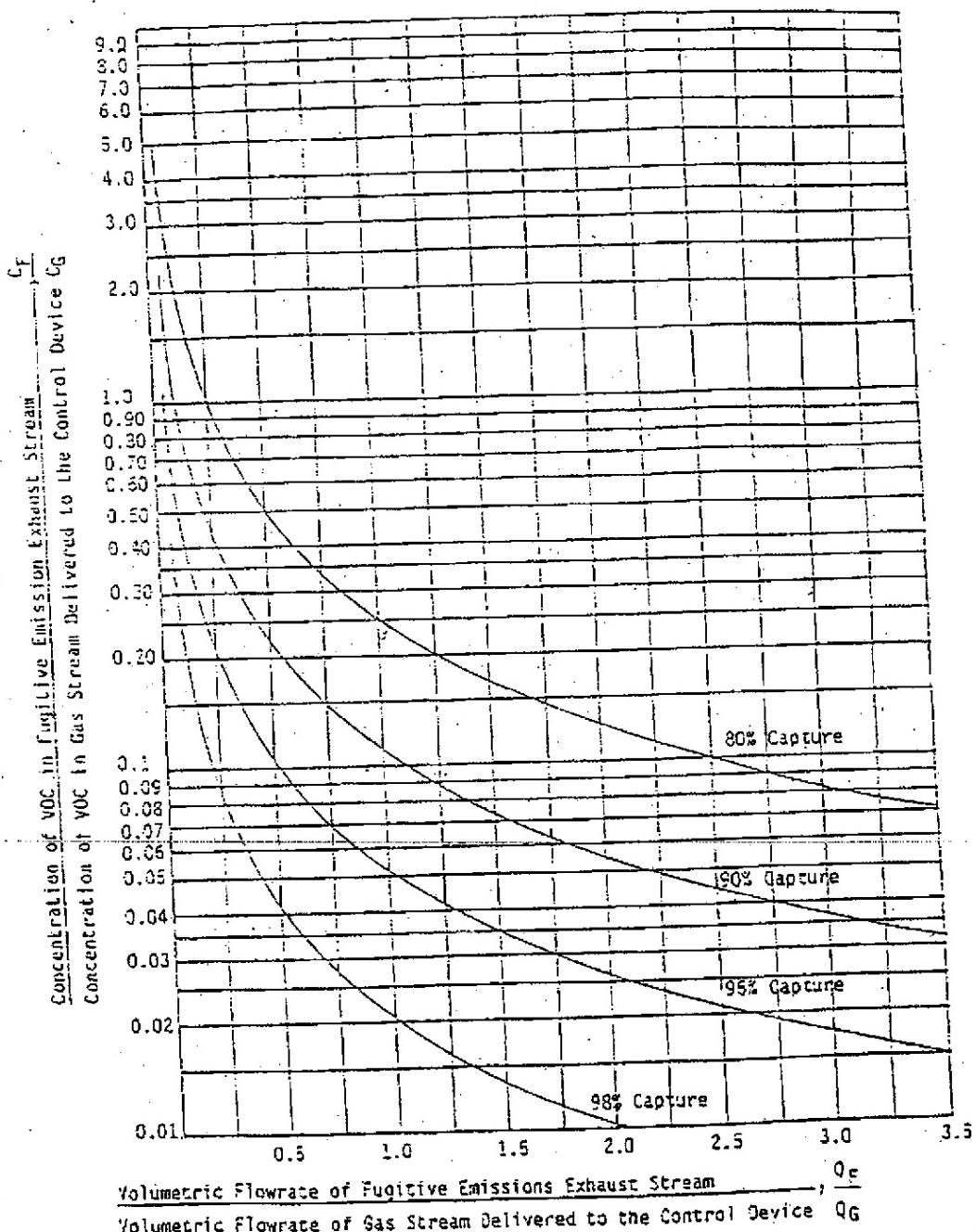
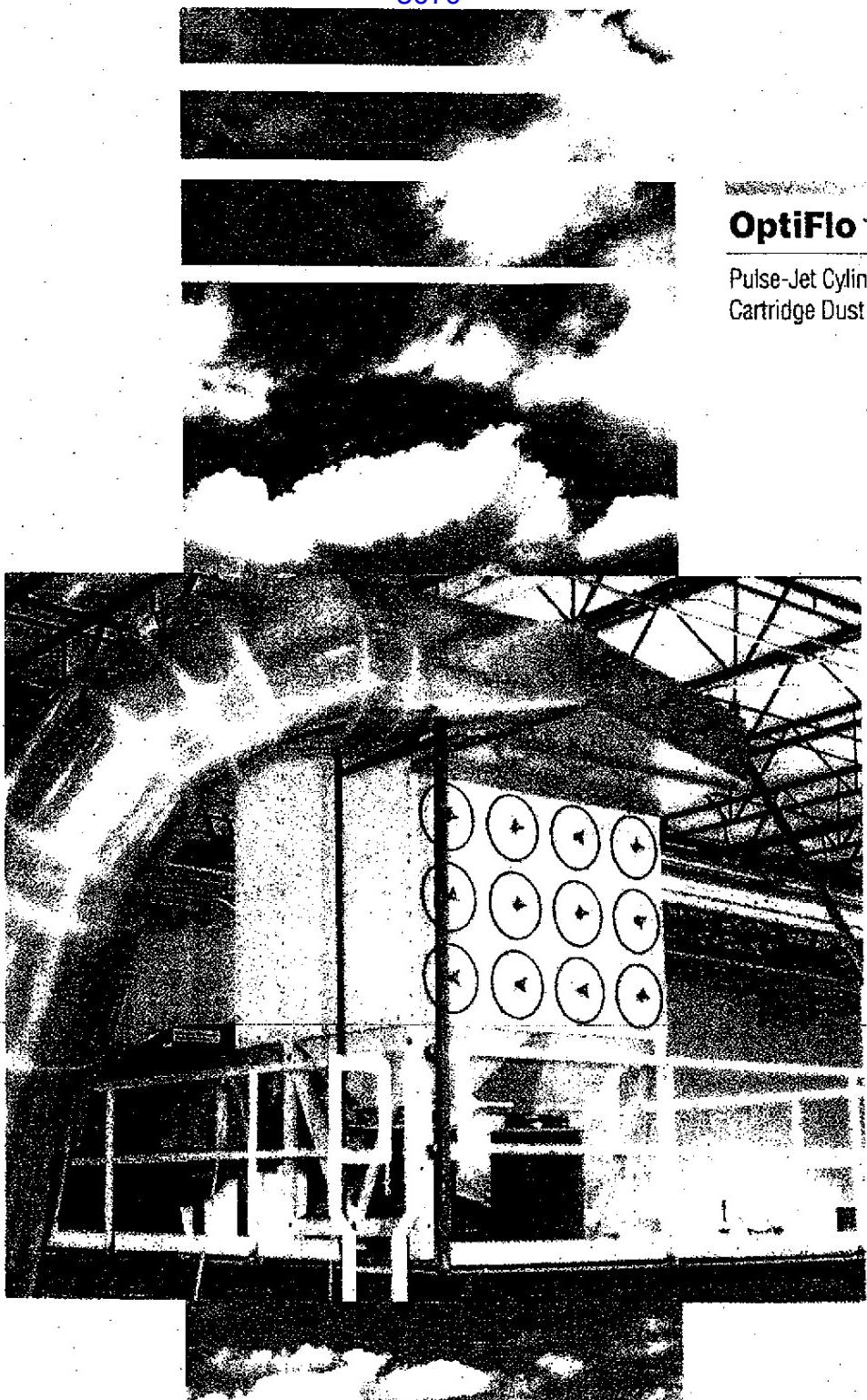


Figure 204-1. The crumpler chart.

**OPTIFLOW DUST COLLECTION**



## OptiFlo®

Pulse-Jet Cylindrical  
Cartridge Dust Collector

B E T T E R   A I R   I S   O U R   B U S I N E S S®

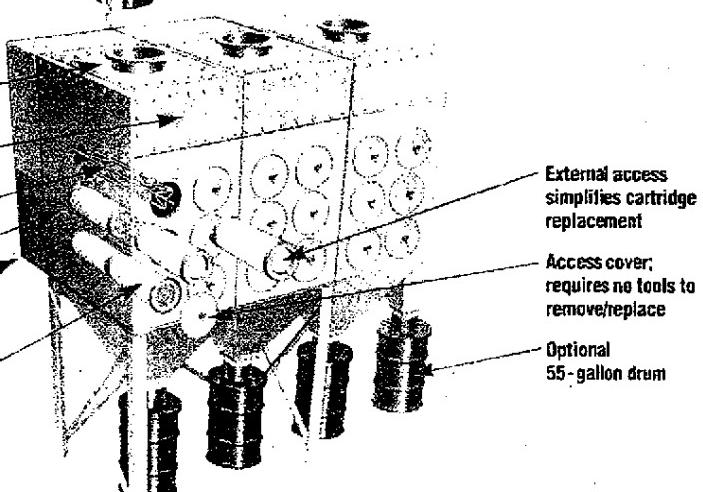
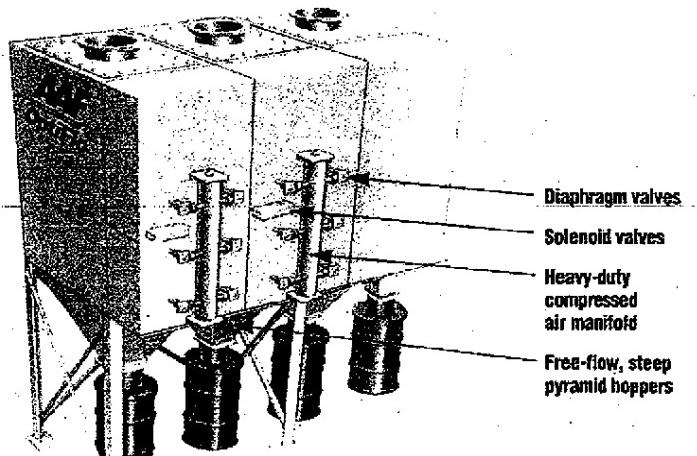
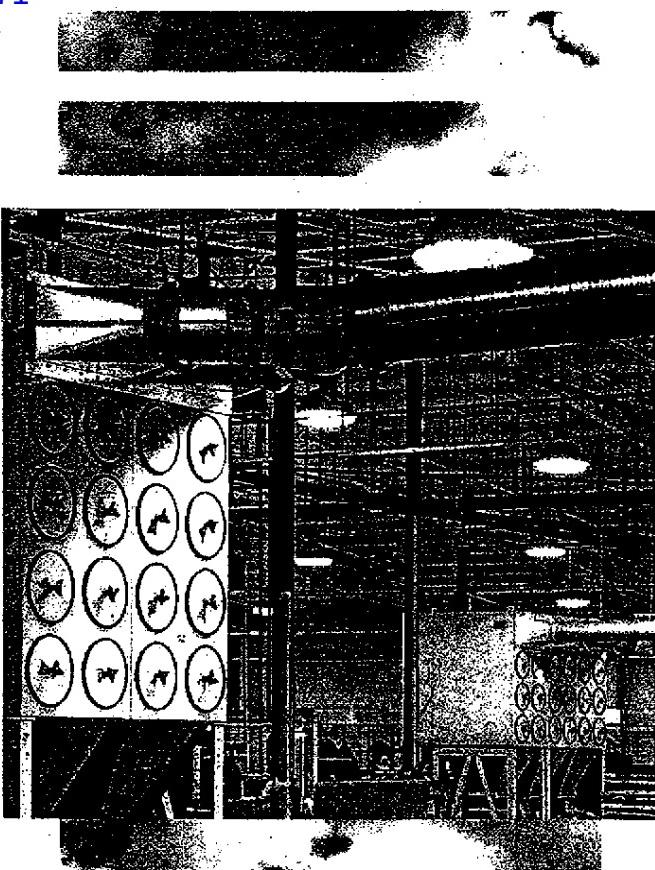


# OptiFlo™

## The Next Generation in Dust Collection

The AAF OptiFlo cartridge collector is the optimum solution to a variety of in-plant air quality problems. The compact modules help conserve valuable space, and can be interconnected to accommodate the largest air cleaning task. OptiFlo collectors may be tailored to specific application requirements with a wide selection of cartridge types, options, and accessories.

- *Up to 10% more airflow capacity at lower operating horsepower than competitive designs*
- *Lowest flange-to-flange pressure drop available*
- *True modular design permits unlimited range of sizes*
- *Choose top/front inlet or side/bottom outlet locations*
- *Solid-state NEMA 4 controls standard*
- *Easy access for cartridge replacement; no tools required*
- *Capabilities include Bag In/Bag Out doors for toxic and hazardous dust applications (standard option)*
- *Reduces plant energy costs*
- *Available with optional ULPA level after-filters (up to 99.9999% efficient on 0.3 micron particulate)*
- *Provides healthier in-plant environment*
- *Increases productivity*
- *Temperature and media options up to 500°F*
- *Completely factory prewired, assembled, and tested (standard option)*



## SPECIAL FEATURES

### Aerodynamic Design

The AAF OptiFlo design easily permits free-fall of dislodged dust to enter the hopper and is designed to prevent direct impingement of dust particles on the media, which minimizes abrasion and dust build-up.

### Rugged Construction

The use of ASME certified welders and ASTM certified steel ensures that every OptiFlo product is built to last. A seismic zone 4 rating is standard. Stainless steel construction is available in 304 or 316L. NEMA 4 controls are standard, with all others available as options.

### Cartridge Seal

OptiFlo filter cartridges have only one gasket sealing surface. This means that the possibility for leakage is significantly reduced. In addition, a continuously welded tube sheet ensures no dust bypass.

### Ease of Maintenance

The AAF OptiFlo cartridge collector is designed for filter replacement from outside of the unit. Personnel do not have to enter the collector to change filter elements, nor are any tools required. Bag In/Bag Out is a standard option.

### Certified RP-531 Efficiency

The OptiFlo has been certified by an independent test laboratory to provide the highest levels of cartridge cleaning efficiency (99.999% efficient on 0.8 micron particulate). Tests were performed in accordance with RP-531. Details available on request.

### Metalworking

- Abrasive Cleaning
- Sandblasting
- Grinding/Polishing
- Laser Cutting
- Metallizing/  
Thermal Spray  
(Arc, Plasma &  
Flame Spray, HVOF)
- Weld Fume
- Battery Manufacturing

### Industrial Processes

- Plastics & Rubber  
(Molding & Grinding)
- Rock & Related  
Products
- Asbestos
- Coal Dust
- Paint Pigments
- Pesticides/Fertilizer
- Powder Paint
- Inorganic Chemicals
- Tobacco

### Food Processing

- Cereals
- Candy
- Chocolate & Cocoa
- Flour & Mixes
- Dog & Cat Food
- Seasonings & Additives
- Milk Solids
- Nut Shells
- Starch

### Pharmaceutical

- Pill Coating
- Pill/Tablet Presses
- Material Handling
- Packaging

### Woodworking

- Furniture Manufacturing
- School Wood Shops
- Cabinetry

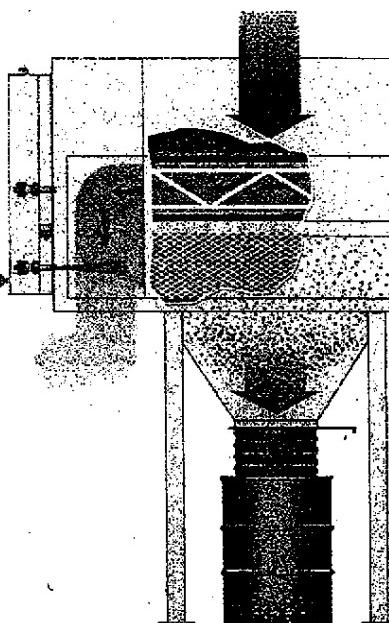
## WORLD CLASS QUALITY

Many of the technologies used to control air pollution were originally developed by AAF. Our facilities are specifically designed to manufacture and test complex air pollution control products. During the entire production process, our operations are governed by our ISO 9001 certified system.

## OPERATION OF THE OPTIFLO

During normal operation, dirty air enters the Optiflo collector through the top inlet and moves in a true downflow direction through the filter cartridges. Dust is collected on the outer surfaces of the cartridge elements. The clean air flows through the center of the elements into the clean air plenum and discharges through the outlet. During cleaning of the elements, a solid-state timer energizes air valves attached to a compressed air supply

manifold. A burst of compressed air is released through the pulse pipes and orifices as a shock wave, which dislodges the dirt from the cartridges. The dislodged dirt falls freely into the hopper below for easy removal.



## SPECIFICATIONS

Model	Filter Area	No. of Cartridges	No. of Valves	Compressed Air Requirement scfm @ 90 Psig	No. of Inlets	Height	Width	Depth	Hopper Outlet Diameter	Quantity Hoppers	Hopper Angle	Shipping Wt. (Lbs.)
2RC4	1100	4	4	3	1	10'8"	3'4"	3'6"	18" x 18"	1	60°	1100
2RC8	2200	8	4	3	1	11'8"	3'4"	7'5"	18" x 18"	1	60°	1850
2RC16	4400	16	8	3	2	11'8"	6'8"	7'5"	18" x 18"	2	60°	3120
2RC24	6600	24	12	6	3	11'8"	10'4"	7'5"	18" x 18"	3	60°	4290
2RC32	8800	32	16	6	4	11'8"	13'4"	7'5"	18" x 18"	4	60°	5460
2RC40	11000	40	20	9	5	11'8"	16'8"	7'5"	18" x 18"	5	60°	6630
3RC6	1650	6	6	3	1	12'2"	3'4"	5'2"	18" x 18"	1	60°	1280
3RC12	3300	12	6	3	1	13'2"	3'4"	7'5"	18" x 18"	1	60°	2530
3RC24	6600	24	12	6	2	13'2"	6'8"	7'5"	18" x 18"	2	60°	3830
3RC36	9900	36	18	9	3	13'2"	10'4"	7'5"	18" x 18"	3	60°	5350
3RC48	13200	48	24	12	4	13'2"	13'4"	7'5"	18" x 18"	4	60°	7120
3RC60	16500	60	30	15	5	13'2"	16'8"	7'5"	18" x 18"	5	60°	8970
3RC72	19800	72	36	18	6	13'2"	20'4"	7'5"	18" x 18"	6	60°	10980
4RC16	4400	16	8	3	1	14'9"	3'4"	7'5"	18" x 18"	1	60°	3130
4RC32	8800	32	16	6	2	14'9"	6'8"	7'5"	18" x 18"	2	60°	4540
4RC48	13200	48	24	9	3	14'9"	10'4"	7'5"	18" x 18"	3	60°	6380
4RC64	17600	64	32	12	4	14'9"	13'4"	7'5"	18" x 18"	4	60°	8290
4RC80	22000	80	40	15	5	14'9"	16'8"	7'5"	18" x 18"	5	60°	10315
4RC96	26400	96	48	18	6	14'9"	20'4"	7'5"	18" x 18"	6	60°	12280
4RC112	30800	112	56	21	7	14'9"	23'4"	7'5"	18" x 18"	7	60°	14210
4RC128	35200	128	64	24	8	14'9"	26'8"	7'5"	18" x 18"	8	60°	16320

## STANDARD OPTIONS & ACCESSORIES

PRODUCT  
SIZES &  
OPTIONS  
SUBJECT TO  
CHANGE

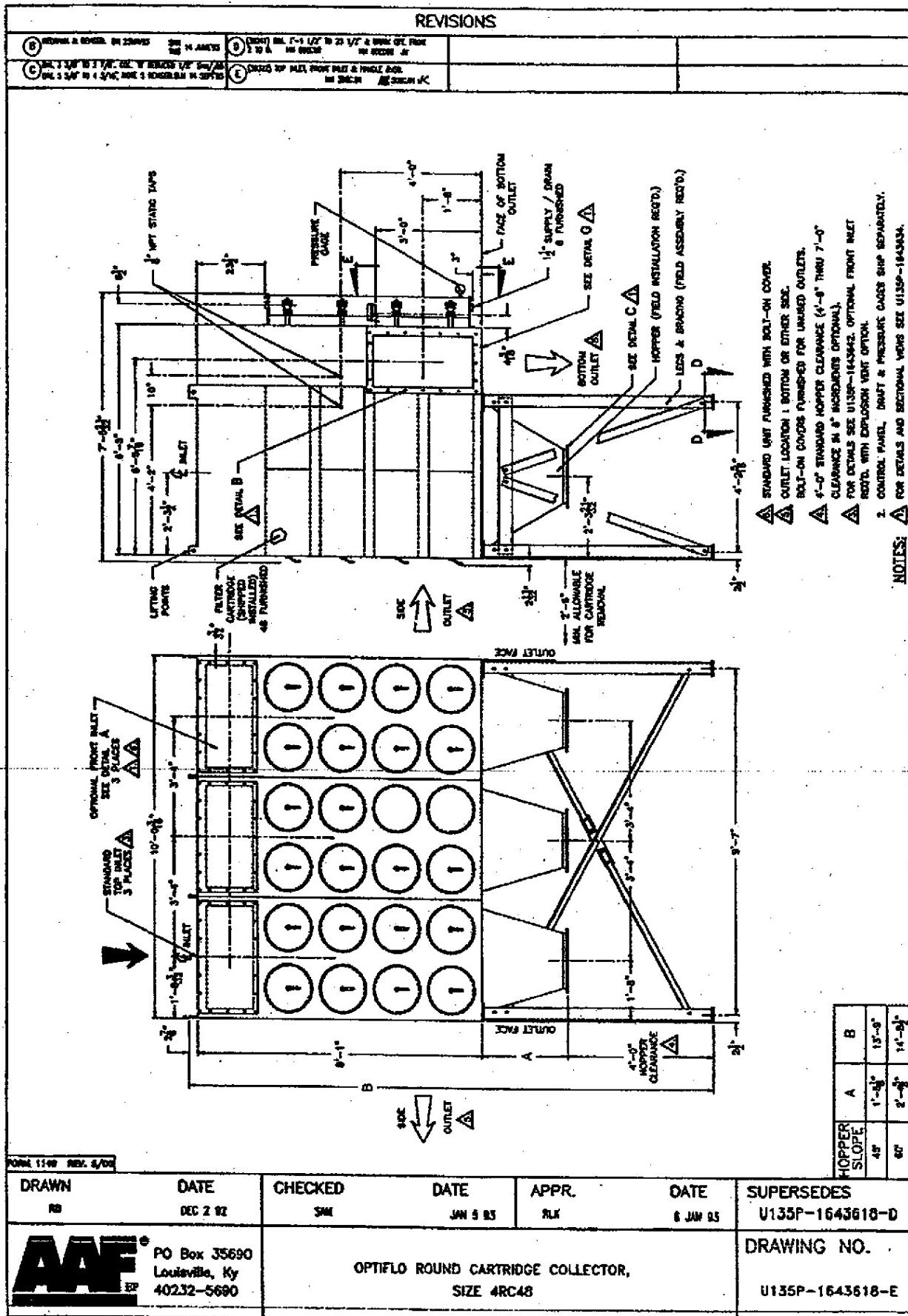
- Stainless Steel Construction (304/316L)
- Alternate Inlet Locations
- Explosion Vents
- Bag In/Bag Out Doors
- Factory Prewiring of Solenoid Valves
- Rotary Valves and Transitions
- Hose and Drum Cover for 55-Gallon Drum
- Access Platform and Ladder
- High Temperature Options
- Fan Packages with Silencers



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Call The Answer Center  
**800.477.1214**





**CARTRIDGE FILTER**